

Activity 4:

Classifying Space Food

Objective

To classify the space food manifested on the Space Shuttle or International Space Station food lists into the major food groups found in the Food Pyramid Guide.

Science Standards

- **Science as Inquiry:** Abilities necessary to do scientific inquiry
- **Science in Personal and Social Perspectives:** Personal health

Materials Needed

Baseline Space Shuttle Food and Beverage List
(Appendix A)

International Space Station Daily Menu Food List
(Appendix B)

USDA Food Guide Pyramid
(Appendix G)

Background

The Food Guide Pyramid has been established to help people maintain a diet that is adequate in nutritional value. Maintaining good health in space is important, and to help do this, a good diet is imperative. Balanced meals of good nutritional food will help ensure that the astronauts will be able to perform their jobs in space.

The U.S. Department of Agriculture (USDA) has made recommendations for a healthy diet. Foods are grouped according to the nutrients they provide. Many foods, such as corn, are hard to place into a specific group. Sweet corn can be counted as a starchy vegetable, but corn tortillas are in the grain group. Dry beans and peas (legumes) can be counted as either a starchy vegetable or a meat.

The following is a web site that can be used to obtain more indepth information about the Food Guide Pyramid and nutrition:

<http://www.usda.gov/fcs/cnpp/using.htm>

Food Groups and Suggested Daily Servings Chart

Food Groups	Suggested Daily Servings
Grain (Bread, Cereal, Rice, and Pasta)	6 to 11 servings
Fruit	2 to 4 servings
Vegetable	3 to 5 servings
Meat (Meats, Poultry, Fish, Eggs, and Nuts)	2 to 3 servings
Dairy (Milk, Yogurt, and Cheese)	2 to 3 servings
Oil (Fats and Sweets)	Use sparingly

Procedure

Using the Baseline Space Shuttle Food and Beverage List or the International Space Station Daily Menu Food List, classify the foods into the major groups as shown above.

Discussion

1. Which foods did you find that can fit into more than one food group?
2. In your opinion, which food group had the better selection of foods?
3. Why is it important to maintain good health in space?
4. How does a balanced diet maintain good health?



Extensions

1. Have the class design their own ISS food menu for a 30-day crew rotation or Space Shuttle food menu for a 7-day rotation. Have them analyze how many times a particular food or drink item was served and if some items were served in combination with another (such as fish always served with french fries). Avoid monotonous or repetitive selection by increasing the variety of food choices.
2. Using a computer, create a data base file. Design a data base template that includes fields such as day (1,

2, 3, etc.), meal (breakfast, lunch, dinner, and a possible snack), and the six major food groups (grain, vegetable, fruit, dairy, meat, and oil). Enter the information from the menus and determine which meals are balanced ones by searching for any empty fields in the food groups.

Assessment

The students will compare and contrast their findings.



Appendix A: Baseline Space Shuttle Food and Beverage List

Abbreviations

A/S	Artificial Sweetener
(B)	Beverage
(FF)	Fresh Food
(IM)	Intermediate Moisture
(I)	Irradiated
(NF)	Natural Form
(R)	Rehydratable
(T)	Thermostabilized

	Chicken, Teriyaki (R)
	Cookies,
	Butter (NF)
	Shortbread (NF)
	Crackers, Butter (NF)
	Eggs,
	Scrambled (R)
	Mexican Scrambled (R)
	Seasoned Scrambled (R)
	Frankfurters (T)
	Fruit,
	Apple, Granny Smith (FF)
	Apple, Red Delicious (FF)
	Applesauce (T)
	Apricots, Dried (IM)
	Banana (FF)
	Cocktail (T)
	Orange (FF)
	Peach Ambrosia (R)
	Peaches, Diced (T)
	Peaches, Dried (IM)
	Pears, Diced (T)
	Pears, Dried (IM)
	Pineapple (T)
	Strawberries (R)
	Trail Mix (IM)
	Granola Bar (NF)
	Ham (T)
	Ham Salad Spread (T)
	Jelly,
	Apple (T)
	Grape (T)
	Macaroni and Cheese (R)
	Noodles and Chicken (R)
Beef w/BBQ Sauce (T)	
Beef, Dried (IM)	
Beef Patty (R)	
Beef Steak (I)	
Beef Stroganoff w/Noodles (R)	
Beef, Sweet n Sour (T)	
Beef Tips w/Mushrooms (T)	
Bread (FF)	
Breakfast Roll (FF)	
Brownies (NF)	
Candy,	
Coated Chocolates (NF)	
Coated Peanuts (NF)	
Gum (NF)	
Life Savers (NF)	
Cereal,	
Bran Chex (R)	
Cornflakes (R)	
Granola (R)	
Granola w/Blueberries (R)	
Granola w/Raisins (R)	
Grits w/Butter (R)	
Oatmeal w/Brown Sugar (R)	
Oatmeal w/Raisins (R)	
Rice Krispies (R)	
Cheddar Cheese Spread (T)	
Chicken,	
Chicken, Grilled (T)	
Chicken Salad Spread (T)	
Chicken, Sweet n Sour (R)	



Nuts,
Almonds (NF)
Cashews (NF)
Macadamia (NF)
Peanuts (NF)
Trail Mix (IM)

Peanut Butter (T)

Potatoes au Gratin (R)

Puddings,

Banana (T)
Butterscotch (T)
Chocolate (T)
Tapioca (T)
Vanilla (T)

Rice and Chicken (R)

Rice Pilaf (R)

Salmon (T)

Sausage Patty (R)

Shrimp Cocktail (R)

Soups,

Chicken Consomme (B)
Mushroom (R)
Rice and Chicken (R)

Spaghetti w/Meat Sauce (R)

Tortillas (FF)

Tuna,

Tuna (T)
Tuna Salad Spread (T)

Turkey,

Turkey Salad Spread (T)
Turkey, Smoked (I)
Turkey Tetrazzini²

Vegetables,

Asparagus (R)
Broccoli au Gratin (R)
Carrot Sticks (FF)
Cauliflower w/Cheese (R)
Celery Sticks (FF)
Green Beans and Broccoli (R)

Green Beans/Mushrooms (R)
Italian (R)
Spinach, Creamed (R)
Tomatoes and Eggplant (T)

Beverages (B)

Apple Cider

Cherry Drink w/A/S

Cocoa

Coffee,

Black
w/A/S
w/Cream
w/Cream and A/S
w/Cream and Sugar
w/Sugar

Coffee (Decaffeinated),

Black
w/A/S
w/Cream
w/Cream and A/S
w/Cream and Sugar
w/Sugar

Coffee (Kona),

Black
w/A/S
w/Cream
w/Cream and A/S
w/Cream and Sugar
w/Sugar

Grape Drink

Grape Drink w/A/S

Grapefruit Drink

Instant Breakfast,

Chocolate
Strawberry
Vanilla

Lemonade

Lemonade w/A/S

Lemon-Lime Drink

Orange Drink

Orange Drink w/A/S

Orange-Grapefruit Drink

Orange Juice

Orange-Mango Drink

Orange-Pineapple Drink



Peach-Apricot Drink

Pineapple Drink

Strawberry Drink

Tea,

- Plain
- w/A/S
- w/Cream
- w/Lemon
- w/Lemon & A/S
- w/Lemon & Sugar
- w/Sugar

Tropical Punch
Tropical Punch w/A/S

Condiments

- Catsup (T)
- Mayonnaise (T)
- Mustard (T)
- Pepper (Liquid)
- Salt (Liquid)
- Tabasco Sauce (T)
- Taco Sauce (T)



Appendix B: International Space Station Daily Menu Food List

Refrigerated

Dairy

Cheese
Cheese slices
Cream cheese
Sour cream
Yogurt, fruit

Fruits

Apple
Grapefruit
Kiwi
Orange
Plum

Frozen

Meat and Eggs

Beef:

Beef, brisket, BBQ
Beef, enchilada with spanish rice
Beef, fajita
Beef, patty
Beef, sirloin tips with mushrooms
Beef, steak, bourbon
Beef, steak, teriyaki
Beef, stir fried with onion
Beef, stroganoff with noodles
Luncheon meat
Meatloaf with mashed potatoes and gravy

Lamb:

Lamb, broiled

Poultry:

Chicken, baked
Chicken, enchilada with spanish rice
Chicken, fajita
Chicken, grilled
Chicken, oven fried

Chicken, pot pie
Chicken, stir fried with diced red pepper
Chicken, teriyaki with spring vegetables
Duck, roasted
Meatball, porcupine (turkey)

Pork:

Bacon
Bacon, Canadian
Ham, baked with candied yams
Pork, chop, baked with potatoes au gratin
Pork, sausage, patties
Pork, sweet and sour with rice

Seafood:

Fish, baked
Fish, grilled
Fish, saut ed
Lobster, broiled tails
Scallops, baked
Seafood, gumbo with rice
Shrimp, cocktail
Tuna, noodle casserole

Eggs:

Egg, omelet, cheese
Egg, omelet, vegetable
Egg, omelet, ham
Egg, omelet, sausage
Egg, omelet vegetable and ham
Egg, omelet, vegetable and sausage
Eggs, scrambled with bacon, hash browns sausage
Quiche, vegetable
Quiche, lorraine

Pasta mixtures:

Lasagna, vegetable with tomato sauce
Noodles, stir fry
Spaghetti with meat sauce
Spaghetti with tomato sauce
Tortellini with tomato sauce, cheese



Other:

Egg rolls
Enchilada, cheese with Spanish rice
Pizza, cheese
Pizza, meat
Pizza, vegetable
Pizza, supreme

Fruit

Apples, escalloped
Peaches, sliced with bananas, blueberries
Peaches with bananas, grapes, strawberries
Strawberries, sliced

Soups

Beef, stew
Broccoli, cream of
Chicken, cream of
Chicken noodle
Mushroom, cream of
Won ton

Grains

Biscuits
Bread
Cornbread
Dinner roll
Garlic bread
Sandwich bun, wheat/white
Toast, wheat/white
Tortilla

Breakfast items:

Cinnamon roll
French toast
Pancakes, buttermilk
Pancakes, apple cinnamon
Waffles

Pasta:

Fettuccine alfredo
Macaroni and cheese
Spaghetti

Rice:

Fried
Mexican/Spanish
White

Starchy Vegetables

Corn, whole kernel
Potato, baked
Potatoes, escalloped
Potatoes, oven fried
Potatoes, mashed
Yams, candied
Succotash
Squash corn casserole

Vegetables

Asparagus tips
Beans, green
Beans, green with mushrooms
Broccoli au gratin
Broccoli
Carrot coins
Cauliflower au gratin
Chinese vegetables, stir fry
Mushrooms, fried
Okra, fried
Peas
Peas with carrots
Squash, acorn with apple sauce and cinnamon
Zucchini, spears, fried

Desserts

Cakes:

Angel food cake
Brownie, chocolate
Chocolate fudge
Shortcake
Yellow cake with chocolate frosting

Dairy:

Ice cream, chocolate
Ice cream, strawberry
Ice cream, vanilla
Yogurt, frozen



Pies and Pastry:

Cheesecake, chocolate
Cheesecake, plain
Cobbler, peach
Pie, apple
Pie, coconut cream
Pie, pecan
Pie, pumpkin

Beverages

Apple juice
Grape juice
Grapefruit juice
Lemonade
Orange juice

Condiments

Margarine
Grated cheese

Cereals

Hot cereal:

Oatmeal
Cream of wheat
Grits

Thermostabilized

Fruit

Applesauce
Fruit cocktail
Peaches
Pears
Pineapple

Salads

Chicken salad
Tuna salad
Turkey salad

Vegetable:

Bean salad, three
Pasta salad
Potato salad, German
Sauerkraut

Soups

Chili
Clam chowder
Egg drop
Miso, Japanese
Vegetable

Desserts

Pudding, butterscotch
Pudding, chocolate
Pudding, lemon
Pudding, tapioca
Pudding, vanilla

Condiments

Barbecue sauce
Catsup
Chili con queso
Cocktail sauce
Cranberry sauce
Dill pickle chips
Dips, bean
Dips, onion
Dips, ranch
Honey
Horseradish sauce
Jelly, assorted
Lemon juice
Mayonnaise
Mustard
Mustard, hot Chinese
Orange marmalade
Peanut butter (chunky, creamy, whipped)
Picante sauce
Sweet and sour sauce
Syrup, maple
Taco sauce
Tartar sauce

Beverages

Fruit juices:

Cranberry
Cranberry apple
Cranberry raspberry
Gatorade, assorted
Pineapple
Pineapple grapefruit
Tomato
V-8



Milk:

Skim
Low fat
Chocolate (low fat or skim)
Whole

Natural Form

Fruit

Apples, dried
Apricots, dried
Peach, dried
Pear, dried
Prunes
Raisin
Trail mix

Grains

Animal crackers
Cereal, cold
Chex mix
Crackers, assorted
Baked chips, tortillas
Baked chips, potato
Pretzels
Goldfish
Tortilla chips
Potato chips
Rye krisp, seasoned

Desserts

Cookies:

Butter
Chocolate chip
Fortune
Rice krispies treat
Shortbread

Snacks

Beef jerky

Nuts:

Almonds
Cashews
Macadamia
Peanuts

Candy:

Candy-coated chocolates
Candy-coated peanuts
Lifesavers
Gum (sugar free)

Eva Food

In-suit fruit bar

Rehydratable

Beverages

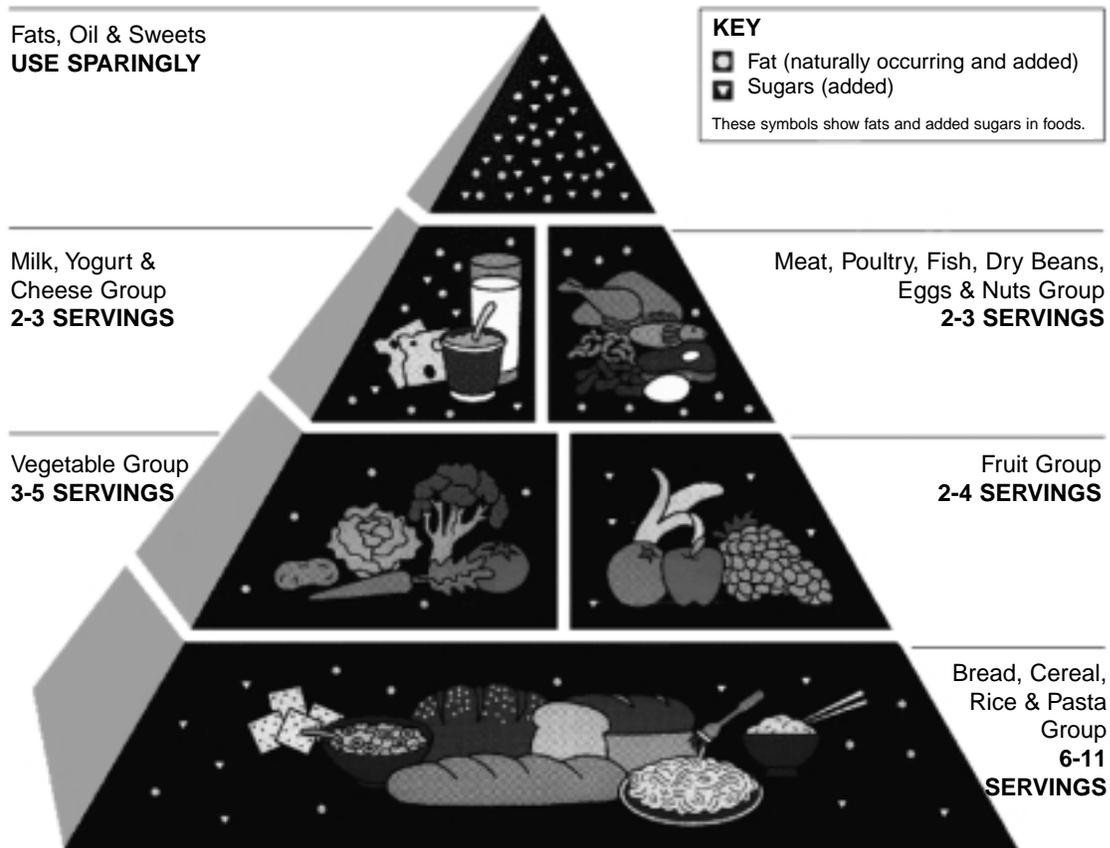
Apple cider
Cherry drink
Cocoa
Coffee (assorted)
Grape drink
Grapefruit drink
Instant breakfast, chocolate
Instant breakfast, vanilla
Instant breakfast, strawberry
Orange drink
Orange mango drink
Orange pineapple drink
Tea (assorted)
Tropical punch

Irradiated Meat

Beef steak
Smoked turkey



Appendix G: USDA Food Guide Pyramid



Source: U.S. Department of Agriculture/Department of Health and Human Services

